Chapter V

Ethnomedicinal Aspects of

Selected Medicinal Plant Species
ETHNO-MEDICINAL ASPECTS OF SELECTED MEDICINAL PLANT SPECIES

Introduction

Utilization of plants for medicinal purposes in India has been documented long back in ancient literature because they are essential to human survival. The consumption, management and valuation of wild plants are central aspects of the traditional knowledge in many human populations. Thus, plants gathering, the diffusion and conservation of knowledge within the community are traditional practices that have contribution to the subsistence of many cultures. In most of the societies the medical system coexists with several traditional systems. These traditional medical systems are generally based on the uses of natural and local products which are commonly related to the people’s perspective on the world and life. In India, there are about 54 million indigenous people of different ethnic groups inhabiting various terrains. These indigenous groups possess their own distinct culture, religious rites, and food habit and have a rich knowledge of traditional medicine (Panghal et al., 2010).

Arid zone of Rajasthan is fortunately gifted with 628 species belonging to 352 genera and 87 families (Bhandri, 1990). About one-fourth of the total plants of the Indian Thar desert are useful for the welfare of human beings and domestic animals for food, fuel, fodder, medicine and other requirements. The erratic rainfall and poor soil fertility have marked effect on the vegetation of the Indian desert. Despite the prevailing harsh climatic conditions, the Indian
Thar desert comprises richest plant diversity among the other desert of the world (Sen, 1991).

Medicinal plants occupied an important position in the socio-culture, spiritual and medicinal arena of rural people of Rajasthan. The inhabitants of remote areas of arid zone of Rajasthan are totally dependent on indigenous system of medicine for their health care as it is difficult for them to get modern medical facilities for their day to day health problems. The traditional healers and inhabitants of arid zone have a rich knowledge of traditional plant based medicines (Jain et al., 2008).

Kalbelia, Nats, Bhils, Raika, Bhopas, Banjara, Gadolia-Lohar, Langa and manganiars communities of district have a rich knowledge of plants based traditional medicines. This indigenous knowledge of plants has been transferred to them from generations to generations by their ancestors. Indigenous knowledge is in danger of being lost due to transformation of traditional culture. To preserve this valuable knowledge, there is a need to document it. This will not only provide recognition of this undocumented knowledge but will also help in conservation of such important medicinal plants.

**Materials and Methods**

Field trips were made at regular intervals for identification, collection of plants and information related with ethno medicinal properties and uses of selected medicinal plant species. The information about the ethnomedicinal
uses of plants to treat various diseases was collected from local people, vendors, tribal communities, social workers, forest officers, agricultural officers and experts of Ayurvedic field. Information on the medicinal plants such as vernacular name, parts of the plant used, form used (fresh/dried), diseases treated, methods of preparation of botanical products, route of administration and other uses of the plant were collected.

**Result**

The study revealed fifteen ethnomedicinal plants belonging to different families are frequently used for the treatment of various ailments by inhabitants. Information regarding their botanical name, family, local name, habitat, flowering and fruiting, morphological characteristics, phytochemical aspects, economic and ethnomedicinal aspects have been described. The photographs of the plants are also given.

1. *Achyranthes aspera* Linn.

**Family**- Amaranthaceae

**Local name**- Undo kanto, Kantio bhuratio

**Habitat** – A typical ruderal of open, dry, waste places, road sides and weed of neglected areas in the gardens.

**Flowering and Fruiting** – August to December

**Morphotaxonomic Characteristics**

An erect or subscandent, annual herb, upto 1 m high, usually branched from near the base, the branches obliquely erect or ascending. Stem angular,
ribbed, thickened above the node, more or less densely hairy. Leaves opposite, elliptic or obovate, form an acute or obtuse base, acuminate or rounded at apex, glabrous except the pubescent nerves beneath; petiols 2-2.5 cm long. Inflorescence terminal and axillary, pedunculate spikes, 3-40 cm long. Flowers deflexed, congested near the apex of the axis, distant near the base. Perianth 4-5 long, greenish-white, subequal, obscurely 3 or more-nerved. Stamens 5, united below into a short tube. Ovary oboviod; style 1, filiform; stigma 2, capitates. Fruit an utricle, oblong-cylindric, truncate at apex, rounded at base. Seeds subcylindric, truncate at apex, reddish-brown.

**Phytochemical Aspects**

The phytochemical investigation showed the presence of alkaloids, glycosides, proteins, free amino acids, lignin, carbohydrates, flavonoids, tannins and phenolic compound (Parmer et al., 2013; Sharma et al., 2013).

**Economic Aspects**

- The seeds are powdered and mixed with the flour to make breads during famine, particularly in the desert.
- The ash of plant yields a dye which is used for colouring and marking their cattle by the tribals of desert.

**Ethnomedicinal Aspects**

- Bhils prepare a paste of root and apply it on the abdomen of women for easy delivery. Tribals take orally the decoction of plant to cure kidney stone and whooping cough.
• A bath with whole plant decoction relieves itching in skin diseases.

• Powder of whole plant cures spleen enlargements.

• Decoction of plant is diuretic while its ash is used in cold and cough.

• Decoction of powdered leaves is useful in the early stage of diarrhoea and dysentery.

• The juice of leaves is valuable in stomach disorders, kidney problems and is also applied externally over cuts and wounds.

• Its powdered root is very useful in pneumonia and cholera.

• Paste of the root is very beneficial in eye disorders (Ophthalmia and opacity of the cornea). Root paste with cold water is given to stop bleeding after abortion.

• Root powder given as an antidote in dog bite, scorpion sting and rat bite.

• Seeds mixed with milk are used as tonic.

2. Aristolochia bracteolata Lamk.

Family- Aristolochiaceae

Local name- Hukka bel

Habitat – A common plant in hedges or amongst roadside pebbles throughout area.

Flowering and Fruiting – September to February
Morphotaxonomic Characteristics

A slender, perennial, prostrate or sub-erect herb. Stem 3-5 dm long, branched, glabrous, angled, striate, sulcate when dry. Leaves 3-9 x 3-8 cm, usually as broad as long, broadly ovate or reniform, obtuse at apex, cordate at base with wide, reticulately veined; petioles 1.2-3 cm long. Flowers solitary; pedicels 7-15 mm long with a large sessile, orbicular or subreniform leafy bract at the base. Perianth 2.5-5 cm long, base subglobose, green; tube cylindric with trumpetshaped mouth, lip linear, dark-purple, glandular, hairy within, margins revolute, finely reticulately veined, as long as the tube. Fruit: a capsule, 1.2-1.8 cm long, oblong-ellipsoid, 12-ribbed, glabrous. Seeds 5-6 mm long, nearly as much broad, deltoid with a slightly cordate base, rugose-black on one side, 2-lobed and whitish on the other side, compressed.

Phytochemical Aspects

Preliminary phytochemical analysis of different solvent extracts revealed the presence of phenols, saponins, flavonoids, glycosides, terpenoids, sterols and lignins (Parveen et al., 2012).

Ethnomedicinal Aspects

- Leaf juice mixed with mustard oil cures skin disease like eczema.

- Leaf paste is used for expulsion of the guinea worms from the affected part.

- The tribals give orally the decoction of roots as a vermifuge against roundworm in children.
• The ladies make a paste of seed in water and apply on the hairs like lotion for softening them.

• Bhil ladies take orally the decoction of plant against menstrual problems.

3. *Calligonum polygonoides* Linn.

**Family** - Polygonaceae

**Local names** - Phog, Phogro.

**Habitat** – A typical sand-dune plant, often covering the entire dune, forms rarely pure associations, but often with Accaia jacquemontii Benth. and Aerva Persica (Burm.f.) Merrill. The young branches which are green and fleshy appear during July-sept.

**Flowering and Fruiting** – April to May

**Morphotaxonomic Characteristics**

A rigid, much branched, almost leaflests shrub. Branches terete, pale, glabrous, the internodes 3-4 cm long; flowering branchlets slender; stipules short, membranous, cupshaped, obliquely truncate, and produced upwards at one side. Flowers pinkish, fasciculate in the axils of ocreae; pedicels 1.5-2.5 cm long. Perianth about 3 mm long, the lobes 2 mm long, obovate, cuneate. Ovary tuberculate; styles 4, slightly connate at the base; stigma capitates. Fruit 6-8 mm long (excluding bristles), oblong densely clothed with reddish-brown bristles dilated at base.
Phytochemical Aspects

The results of preliminary phytochemical analysis revealed the presence of alkaloids, phenolic compounds, tannins, steroids, flavanoids and terpenoid (Samejo et al., 2011).

Economic Aspects

- The wood is used in building huts.
- The branches are eaten by camels.
- The flower buds, locally called as “Lasson” in the desert area, are eaten by the tribal’s with butter milk adding some salt during summer.
- The plant is largely consumed for fire wood by the native of the desert.
- Some time they also prepare coal and sell it in the nearby to the ironsmith for their use.

Ethnomedicinal Aspects

- The aqueous paste of whole plant is given orally to the person who has taken heavy dose of opium as it acts as emetic.
- It gives cooling effect to the body.
- Flower buds effective in sun stroke.
- Flowers and fruits used in butter milk during summer.
- The juice of plant applied in eyes to remove the poisonous effect of Calotropis procera latex if gets in to or contacted with eyes.
• Decoction of the plant after boiling is used as a gargle for the sour-gums by Bhils and Gadulia Lohar.

4. *Cardiospermum halicacabum* Linn.

**Family-** Sapindaceae

**Local names-** Kapal-phori, Gandio

**Habitat** – Commonly spreading on shrubs and hedges.

**Flowering and Fruiting** – September to November

**Morphotaxonomic Characteristics**

A slender, herbaceous annual from perennial root stock. Stem deeply sulcate, finely downy or at length glabrous. Leaves alternate, biteminate 3-9 x 2-7 cm, segments deeply incisopinnatifid, ovate, membranous, glabrous or pubescent, serrate, acute or narrowed at the base and apex; petioles 2.5-5 cm long, herbaceous, Flowers white, in 3-fid, axillary umbels; peduncles slender, 3-10 cm long, with a pair of tendrils from near the apex; pedicle very slender; bracts minute, linear; sepal 4. Petals 4, 2 upper provided with a large scale below the base; lower ones smaller, provided with a small crested scale. Stamens 8, filaments unequal. Fruit bladdery capsule, distinctly stalked, depressed-pyriform, trigonous, membranous, slightly winged at the angles, veined, green at first, straw-coloured at length. Seeds globose, smooth, black, with a small, white, heart-shaped aril.

**Phytochemical Aspects**

The preliminary phytochemical analysis revealed the presence of alkaloids,
cardiac glycosides, flavonoids, saponins, steroids and tannins (Sughuna et al., 2011; Shareef et al., 2012; Suresh et al., 2012).

**Ethnomedicinal Aspects**

- Bhils apply paste of plant to cure rheumatism and stiffness of limbs.
- The juice of plant cures earache. Roots are diuretic and laxative.
- According to charak, Sushrat and Vagbhatt the plant is used as an antidote to snake and scorpion bite.
- The extract of plant is used to regulate the menstrual cycle.

5. **Evolvulus alsinoides** Linn.

**Family**- Convolvulaceae

**Local name**- Phooli

**Habitat** - The plant grows on very dry, open localities, usually on rocks; also common on grassy lands waste places.

**Flowering and Fruiting** - August to November

**Morphotaxonomic Characteristics**

Stems few to many, from a perennial root-stock, prostrate or ascending, slender, thinly adpressedly pilose. Leaves more or less densely adpressedly pilose on both surface, some-time more or less glabrous above. Peduncles filiform, shorter than or exceeding the leaves, 1-few flowered; bracteoles linear-lanceolate; pedicels generally longer than the calyx, pilose. Calyx: sepals lanceolate, acute or acuminate, villous. Corolla rotate, pale-blue or
white. Capsule globular, glabrous, 4-valved, usually 4-seeded. Seeds black, smooth.

**Phytochemical Aspects**

The preliminary phytochemical screening showed *Evolvulus alsinoides* contain some secondary metabolites such as glycosides, alkaloids, saponins, volatile oil, flavonoids and tannins (Omogbai *et al.* 2011; Madhavan *et al.* 2013; Indhumol *et al.* 2013).

**Ethnomedicinal Aspects**

- Decoction of whole plant effective in fever, debility, loss of memory and syphilis.

- It is also used as a brain tonic.

- Leaves smoke is used by tribals in chronic bronchitis and asthma.

- Flowers useful for treating the uterine bleeding.

- Roots are antidysentric and antiseptic used to treat gastric ulcers and intermittent fever.

- Seed oil promotes the growth of hair.

**6. Grewia tenax** (Forsk.) Fiori.

**Family** - Tiliaceae

**Local name** - Gangeran, *Gangara*.

**Habitat** - Most common shrub growing amongst Euphorbia bushes on the
rocky gravelly wastelands and forests of the area.

**Flowering and Fruiting** - August to October, September to December.

**Morphotaxonomic Characteristics**

A shrub or undershrub, 0.5-2 m high. Branches slender, thinly pubescent, green when young, smooth, lenticelled and ashy-grey when old, divaricating, rigid. Leaves broadly ovate, orbiculate at base, acute or obtuse at the apex, coarsely dentate, palmately 3-5 nerved; petioles 5-8 mm long, slightly thickened at apex, pubescent, caduceus. Flowers on simple pubescent peduncles which are slightly thickened near the apex, leaf-opposed or terminal on short contracted branches (spur); bracts 2 or more, usually 3, pale, pubescent, caduceus, leaving the scar, giving a jointed appearance to the peduncle. Sepals & petals white and glabrous. Stamens many, filaments pinkish-white, unequal. Ovary 4-lobed, glabrous; style, longer than stamens, glabrous; stigma 4-5 lobed, green. Fruit lobed drupe, smooth, shining, orange-yellow when mature.

**Phytochemical Aspects**

Saadabi *et al.*, (2006) reported the medium concentration of sterols and high concentration of flavonoids and alkaloids in leaves. Ahmed *et al.*, (2011) isolated eleven compounds from ethyl acetate soluble fraction of whole plant of *grewia tenax*. Analysis of the nutritional composition of fruit was carried out by Elhassan *et al* (2010). The result showed that fruit contain high amount of essential amino acids (Histidine, Isoleucin, Leucin, Lysin, Threonine, Valine)
which fulfils the requirement of the WHO standard proteins. Fruit also contain mineral elements (K, Ca, Mn, Fe, Cu and Zn), tannin and pectic substance.

**Economic Aspects**

- Mature fruits are eaten by local people and shepherds.
- Boiled Leaves are eaten as vegetable.
- The native much used this plant as a source of fire-wood.

**Ethnomedicinal Aspects**

- Decoction of the stem bark is used as a remedy against cough and muscular pain. Mucilage of the bark is used in the treatment of tuberculosis.
- Decoction of the fruit is used to cure asthma, cough and urinary problems.
- Young roots are eaten to cure diarrhea.
- Fruits eaten by villagers to quench thirst during summer season. It has cooling effect.


**Family** - Celastraceae

**Local name** - Kankero, Kankari

**Habitat** - It is an evergreen small tree common in open fields that tolerates various types of stresses of the desert.
Flowering and Fruiting - October to February

Morphotaxonomic Characteristics

A small, compact tree, 3-5 m high; young branches purple, often spiny, with leaves and flowers on the spines. Leaves 4-7 x 2-3.5 cm, coriaceous, much variable in size and shape, secondary nerves 6-10, tapering at base; petiole 3-9 mm long, usually purple. Flowers prolific, in di or tri-chotomous, axillary cymes or fascicles, white; pedicels filiform, jointed below middle, bracts small, lanceolate, acute. Calyx lobes rounded at apex, ciliate. Corolla 3 mm long, elliptic-oblong. Filaments flattened and dilated at base. Disc fleshy, 10-lobed. Ovary glabrous, orbicular. Fruits 6-7 mm in diam., Purple or nearly black when ripe, coriaceous, usually 2-valved. Seeds 1-2, rarely 3, with a thin aril.

Phytochemical Aspects

Phytochemical screening revealed that the plant contains highest amount of soluble sugar, protein and lipid in fruits, starch and phenol in roots, amino acid and ascorbic acid in leaves as compared to other parts of the plant (Sagwan et al., 2010).

Economic Aspect - It provides fodder, timber and fuel.

Ethnomedicinal Aspects

- Tender shoots of the plant help for mouth ulcer.

- The stem bark is ground to a paste and applied with mustard oil to kill lice in the hair.
• Decoction of the leafy twigs is used as a mouthwash to relieve toothache.

• Ash of leaves used by tribals to heal up sores and wound gives cooling effect.

• The leaves are burnt and mixed with ghee to form an ointment used to heal sores.

• The tender leaves are chewed raw in the treatment of jaundice.

• The fruits are used in medicines to purify blood.

• The milkman gives the fruits to cows and buffaloes to feed for increasing milk production.

• The leaves, which serve as a good fodder to goats, are also believed to increase the milk production.


**Family** - Aizoaceae

**Local name** – Chiriya-ro-khet

**Habitat** – Common weed in dry and sandy habitats, waste lands and cultivated fields.

**Flowering and Fruiting** – September to November

**Morphotaxonomic Characteristics**

A glabrous, many-stemed, erect, slender, annual, 5-18 cm high. Stem
pale-coloured, filiform, rigid; branches umbellate, the nodes thickened. Leaves sessile, often withering early. Inflorescence axillary or terminal, pedunculate or not, umbelli-form, 1-4 flowered. Peduncles upto 16 mm long; pedicels upto 4-9 mm long, stiff. Flowers greenish. Perianth-segments 5, margins white, membranous. Stamens usually 5, rarely 3. Stigma 3, short. Fruit a capsule equaling in length to perianth lobes. Seeds numerous, smooth, brown, compressed, more or less triangular in outline.

**Phytochemical Aspects**

Phytochemical screening revealed that the crude extract and n-butanol fraction contains alkaloids, flavonoids, saponins, triterpenoids, tannins, glycosides and phenolic groups while the ethylacetate fraction contains active constituents like saponins, glycoside, triterpenoids and steroids (Valarmathi *et al.*, 2012).

**Ethnomedicinal Aspects**

- An infusion of plant is used in fevers and for promoting lochial discharges and blood purification.

- Oil prepared by boiling the roots in any edible oil tribals apply externally for gout and rheumatism.

- Seed boiled in water and filtrate is taken orally to keep body cool during summer.

**Family**- Rosaceae

**Local names**- Chapari.

**Habitat** – A common plant on sand dunes of western Rajasthan.

**Flowering and Fruiting** – October to December

**Morphotaxonomic Characteristics**

A woody, lomentose annual with diffuse or procumbent branches. Stem, densely woody. Leaves alternate, ovate-oblong, with 1-3 obtuse lobes on each side, cuneate or rounded at base densely tomentose on both surfaces; petioles long, densely woolly. Flowers solitary, axillary, pedicelled, white. Sepals 5, depressed conical about; tube flat, spinny forming a conical disc with the ripe carpels, the teeth triangular, 2 mm long. Corolla : petals 5, inserted on the throat of calyx tube, obovate-cuneate or oblanceolate. Stamens 10, inserted on calyx mouth; filaments short. Carpels 10, united with one another and also with the calyx tube, terminated by spinescent style. Fruit a depressed cone, 1.5 cm in diam., orbicular densely woolly, lower surface quite flat.

**Phytochemical Aspects**

Marzouk *et al.*,2013 isolated seven flavonoids from the whole plant of *Neurada procumbens*.

**Ethnomedicinal Aspects**

- One tea spoon dried powder of the whole plant is given with fresh goat’s
milk early in the morning to patient who is suffering from heat stroke during summer season.

- It is also a good tonic.

10. Ocimum americanum Linn.

**Family**- Lamiaceae

**Local name**- Vantulsi.

**Habitat** – The plant is occasionally found in ravines, where some water collects during rains, locally abundant and its strong aromatic smell marks the plant conspicuous.

**Flowering and Fruiting** – August to October

**Morphotaxonomic Characteristics**

An erect, much branched. Stem striate, subquadrangular, pubescent. Leaves elliptic-lanceolate, tapering at both ends, entire and gland-dotted on both surfaces; petioles upto 2.5 cm long, hairy. Flowers in close whorls, 8-20 cm long; bracts elliptic-lanceolate, ciliate with long, white hairs. Calyx pubescent, gland-dotted, upper lip suborbicular, rather broader than long, veined, ciliate; lower lip with 4 lanceolate, subulate teeth, the two central ones longer than laterals and exceeding the upper lip. Corolla: White, upper lip broadly oblong, 4-toothed; lower lip narrower and longer than the upper lip. Stamens exerted, hairy at the knee. Fruit: nutlets narrowly ellipsoidal, black, punctulate.

**Phytochemical Aspects**

The results of preliminary phytochemical analysis revealed the presence
of alkaloids, phenolic compounds, tannins, lignin, starch, saponins, flavanoids, terpenoid and anthraquinone (Dhale et al., 2010; Sarma et al., 2011).

**Ethnomedicinal Aspects**

- The local vaids prescribe leaf paste to apply on parasitical skin diseases.
- It is also applied on the fingers and on the nails to control fever.
- Bhils boil the seed in the milk and drink it to cure urinary duct inflammations and fever. Decoction of plant is taken internally to provide relief in cough and fever.
- Tribals also rub the paste of leaves on the forehead and near the nose to cure headache and fever.

11. *Pergularia daemia* (Forsk.) Chiov.

**Family**- Asclepiadaceae

**Local name**- Gadariari Bel

**Habitat** – A hairy perennial twining climber common in field hedges throughout the arid area.

**Flowering and Fruiting** – August to December

**Morphotaxonomic Characteristics**

An extensive, perennial, twinning under-shrub with milky juice. Stem slender, clothed with long, bulbous-based, spreading hairs mixed with short thin hairs, terete, obscurely striate. Leaves 5-12 x 3-9 cm, thin, broadly ovate, glabrous; margins entire, apex acute to acuminate, base deeply cordate,
the lobes rounded; petioles 2-6 cm long, pubescent as the stem. Flowers greenish-yellow to dull-white, peduncles arranged first in a corymbose manner and afterwards becoming racemose; pedicels 1-3 cm long, filiform, pubescent; bracts lanceolate, acute, pubescent. Calyx divided to the base. Corolla tube narrowly campanulate, completely adnate to the base of the staminal column. Follicles reflexed, lanceloate, attenuated into a long beak, densely echinate all over with soft spines, the latter ciliate and often branched. Seeds, ovate, truncate at the apex, densely velvety pubescent on both sides.

**Phytochemical Aspects**

The preliminary phytochemical analysis revealed the presence of alkaloid, terpenoid, tannin, saponin, reducing sugar, cardiac glycoside, glycoside and phlobatannin (Jogi et al. 2012; Sridhar et al. 2012).

**Economic Aspects**

The bast fiber obtained from the stem is used for making ropes and cordages.

**Ethnomedicinal Aspects**

- Tribals take orally the powder of root bark with water as purgative.

- Leaf juice is taken orally to cure asthma and urinary obstruction.

- Externally it is applied to rheumatic swellings.

- Paste of leaves also applied as a poultice to relieve carbuncles and on the swelling due to guinea-worm.

**Family**- Portulacaceae

**Local names**- Luni, Kulfo.

**Habitat** – Common weed in cultivated fields, sandy riverbeds, gardens and also cultivated as vegetable.

**Flowering and Fruiting** – August to December

**Morphotaxonomic Characteristics**

Annual, glabrous, fleshy herb, with numerous, radially spreading or prostrate branches. Leaves alternate, often somewhat crowded towards end of branches, sessile, obovate-spathulate. Flowers terminal, 1-5 together, sessile, surrounded by a cluster of subverticillate leaves; bracts membranous, ovate-acuminate. Sepals united below into a tube; free profion fleshy, oblongovate, keeled or slightly winged. Petals yellow, united at base, obovate-oblong, rarely emarginate. Stamens 7-12. Ovary ovoid; style short, with 3-6 subulate lobes. Capsule obovoid to ovoid, seeds many, 0.5 mm in diam., dull-black, reniform, verrucose-granulate.

**Phytochemical Aspects**

Preliminary phytochemical screening mainly revealed the presence of alkaloids, carbohydrates, flavonoids, aminoacids, proteins, steroids, saponins, fixed oils, tannins and phenolic compounds (Bagepalli Srinivasa *et al.*, 2008).

Recent research has shown that *P. oleracea* is a rich source of omega-3 fatty acids, which are thought to be important in preventing heart attacks and
strengthening the immune system [Bown, 1995]. The whole plant contains carotene, vitamins C, B$_1$, B$_2$, PP; Ca, Mg, Na, K salts; organic acids, nicotinic and oxalic; noradrenaline, and the biflavonoid liquiritin [World Health Organisation, 1990].

**Ethnomedicinal Aspects**

- Whole plant eaten as vegetable for the treatment of scurvy and diseases of liver, kidney, spleen and bladder.

- Fresh leaf juice is an effective thirst quencher and cools the body.

- A paste of leaves is applied externally to the burns, swelling and scalds for its cooling effect.

- Stem juice applied externally relieves prickly heat and to the hands and feet when burning sensation is felt.

- Plant sap smeared on the body during summer provides relief in blister and boils. Powered seeds are also used in heat burn, in diarrhea and as a demulcent by the Bhils. Seed paste is also applied over burns and scalds.

**13. Salvadora persica Linn.**

**Family-** Salvadoraceae

**Local name-** Kharo jhal

**Habitat –** Common in moderately saline alluvial habitats of the desert area, forming dominant part of the vegetation.
Flowering and Fruiting – December to June

Morphotaxonomic Characteristics

A much branched, evergreen, small spreading tree or large, straggling shrub with spreading or drooping, glabrous, terete, more or less glaucous branches, the two opposite branches arising symmetrically at an angle of 45 to the main axis. Leaves opposite, deccusate, somewhat fleshy. Flowers greenish-yellow, in axillary and terminal, compound, lax penicles which are 5-15 cm long. Clayx less than 1 mm long, glabrous; cleft half-way down. Corolla very thin, deeply cleft, persistent. Stamens 4, smaller than corolla, exserted Ovary minutely pedicelled. Fruit a berry, 6-7 mm in diam., globose, smooth, red when ripe, supported by persistent yellow cup of calyx. Seed 1, 4 mm in diam., sub-globose, smooth, brown.

Phytochemical Aspects

Phytochemical screening revealed the occurrence of carbohydrates and/or glycosides, sterols, terpenes, flavonoids and alkaloids (Ahmed et al., 2008).

Economic Aspects

• The wood is useful for making huts, houses and agricultural implements.

• The tree is also a good source of fire wood.

Ethnomedicinal Aspects

• Paste of root bark and leaves is also applied on blisters by natives.
• Decoction of leaves is taken orally in asthma, cough and constipation problem.

• Leaves paste and seed oil applied externally cures rheumatism.

• The nomadic tribe, Gadulia Lohar, give the decoction of root bark orally to cure fever. The natives widely use young branches as toothbrushes to cure the problem of toothache and gums.

• Fruits are crushed in water and given orally against snake-bite for inducing vomiting.

14. Sarcostemma acidum (Roxb.) Voigt.

Family- Asclepiadaceae

Local name- Khirkhimpari

Habitat – The plant is common throughout the area climbing on Euphorbia caducifolia.

Flowering and Fruiting – August to November

Morphotaxonomic Characteristics-

A leafless, straggling, jointed shrub, with many branches. Stem cylindrical, green, pubescent when young, glabrous with age, joints 1-3 dm long. Leaves very minute, opposite on young branches, caduceus, broadly ovate, acute, concave, adpressed, pubescent. Flowers white, in many-flowered, sessile umbels at the end of the branches; pedicels 6-8 mm long, slender, pubescent. Calyx divided to the base; ovate-oblong, obtuse with membranous
and sparsely ciliate margins. Corolla pale-green or white, rotate, divided nearly to base, ovate-oblong, subacute, margins revolute. Outer corona crenately 10-lobed on the margins, lobes of inner corona thick, fleshy, obtuse, longer than the staminal column, almost concealing the anthers. Staminal column very short; pollen masses waxy, compressed, orange. Ovaries glabrous, many-ovuled; style apex shortly conical. Follicles thick, lanceolate, tapering to both ends, straight, glabrous.

**Phytochemical Aspects**

Preliminary phytochemical analysis of different solvent extracts revealed the presence of alkaloids, carbohydrates, Glycosoides, tannins, protein, amino acids and steroids (Gupta *et al.*, 2010).

**Ethnomedicinal Aspects**

- Whole plant extract is used internally to relieve rheumatic pains.

- Root is ground and applied to snake bite and taken as an infusion in dog-bite cases. Aqueous extract of the stem is given orally for bone setting and in rheumatic pains.

- Dried stem is emetic.

- The stem is some time used as substitute for Ephedra gerardiana as ‘Soma’ in Ayurveda.
15. *Trianthema portulacastrum* Linn.

**Family**- Aizoaceae

**Local name**- Safed santo

**Habitat** – A common weed of waste place in shade, sun, saline and nonsaline area, gardens as well as in the cultivated fields.

**Flowering and Fruiting** – August to December

**Morphotaxonomic Characteristics**

A somewhat succulent, subglabrous, annual herb. Stems spreading, procumbent or prostrate, often alternately branched by the development of axillary buds, subtended by the small leaf of the nodal pair. Leaves opposite, one of the pair smaller than the other, petiolate, stipulate, obovate to rounded, glabrous on both surfaces; petiole, sparsely hairy, expanded into a sheathing, membranous base, connate with that of the opposing leaf, surrounding the stem. Flowers axillary, solitary, sessile, partly hidden by the base of the petiolar sheath. Perianth-tube campanulate, lobes petaloid, white or pink. Stamens 10-20, inserted on perianth tube. Ovary truncate, bilobed. Fruit a capsule almost enclosed in the petiolar sheath. Seeds 5-10, lenticular, reniform, more or less concentrically wrinkled, black.

**Phytochemical Aspects**

*Trianthema portulacastrum* contains crude protein similar to Lucerne with relatively low structural carbohydrate, minerals calcium, magnesium, iron, copper, zinc and manganese (Bharathidhasan *et al.* 2007).
Ethnomedicinal Aspects

- Tribals take orally fresh juice of plant to purify blood and to cure pain and swelling of joints.

- Decoction of plant is taken orally to cure night blindness.

- Leaves are eaten as vegetable for eye problems.

- Root paste is used externally for treating itching, corneal ulcer and night blindness.

- Root infusion is used internally to cures constipation and dropsy.

Conclusion and Recommendations

The survey indicated that the study area has plenty of medicinal plants to treat a wide spectrum of human ailments. Studies on traditional medicinal plants revealed that the local people prefer folk medicine due to low cost and sometimes it is a part of their social life and culture so it is necessary to acquire and preserve this traditional system of plant utilization by proper documentation and identification of specimen. As per WHO report, we are living in a continent, where 80% of the population is not in a position to afford proper health care services and in turn relies upon wild medicinal plants because of their acquaintance, unproblematic access, easy use and efficacy (Anon, 2009). Therefore, medicinal plants of this area may be helpful at world level for pharmaceutical sector and conservation biologists. Although these plants are being utilized for human welfare, but due to unawareness and
illiteracy among the commons, in vogue practices like indiscriminate cutting for firewood and silage, cipher efforts for conservation etc. may result in the outright disappearance of some species from local flora. On the other hand, formidable challenges like climatic variations; poor soil fertility etc. has marked effects on available vegetation. Sustainable harvesting of these plants is essential. Thus there is a need to create awareness of importance of these plants among local people and to provide them guidance and training in collection and processing to enhance the economic benefits from local flora. Here, cultivation and conservation of medicinal plants can become a flourishing industry. This dream can only come true if we all either indigenous population or personnel from scientific avenues come together and take up the gauntlet. Therefore, this is the most appropriate time to adopt a doable strategy emphasizing on studies for detection and separation of novel active constituents from the reported indigenous species. In addition to this, concrete measures must be taken to restore this green treasure.
Plate 5.1: *Achyranthes aspera* Linn.

Plate 5.2: *Aristolochia bracteolata* Lamk.

Plate 5.3: *Calligonum polygonoides* Linn.
Plate 5.4: *Cardiospermum halicacabum* Linn.

Plate 5.5: *Evolvulus alsinoides* Linn.

Plate 5.6: *Grewia tenax* (Forsk.) Fiori.
Plate 5.7: *Maytenus emarginata* Willd.

Plate 5.8: *Mollugo cerviana* Ser.

Plate 5.9: *Neurada procumbens* Linn.
Plate 5.10: *Ocimum americanum* Linn.

Plate 5.11: *Pergularia daemia* (Forsk.) Chiov.

Plate 5.12: *Portulaca oleracea* Linn.
Plate 5.13: *Salvadora persica* Linn.

Plate 5.14: *Sarcostema acidum* (Roxb.) Voigt.

Plate 5.15: *Trianthema portulacastrum* Linn.
Research Scholar with Chanan Ram, Jitander and Rugha Ram

Research Scholar Talking with Gadolia Lohar Bharo ji

Research Scholar with Local Vaidya Jawhar Mal
Preparing Herbal Medicine
Research Scholar with Villager Sawai Lal

Research Scholar with Agriculture Officer Shankar Lal Kantwa

Research Scholar Talking with Farmer Sugna Ram